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ABSTRACT

Forty first graders and 40 fifth graders were asked to allocate a limited number of rewards to two children working on identical tasks. Four experimental conditions were established by varying the workers' relative productivity and effort on the task. Fifth graders were generally found to utilize the norm of equity more than first graders in allocating the rewards. Significantly more fifth than first graders reported perceiving a difference in the workers' effort on the task. The first graders' allocations were generally uninfluenced by the manipulation of this performance dimension. In addition no effect of effort was found for the fifth graders under the condition of equal worker productivity. Under the condition of unequal productivity the fifth grade boys divided the rewards proportionally regardless of the workers' relative effort; their female counterparts allocated in a similar manner only when the more productive worker had also demonstrated greater effort on the task. The manner in which the developing child makes decisions regarding what is a fair and deserved amount of resources for others to receive, and factors influencing these decisions, appears an important area for continued study. (Author)

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Workers' Effort and Product:

A Developmental Study of Reward Allocation

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Abstract

Forty first graders and 40 fifth graders were asked to allocate a limited number of rewards to two children working on identical tasks. Four experimental conditions were established by varying the workers' relative productivity and effort on the task. Fifth graders were generally found to utilize the norm of equity more than first graders in allocating the rewards. Significantly more fifth than first graders reported perceiving a difference in the workers' effort on the task. The first graders' allocations were generally uninfluenced by the manipulation of this performance dimension. In addition no effect of effort was found for the fifth graders under the condition of equal worker productivity. Under the condition of unequal productivity the fifth grade boys divided the rewards proportionally regardless of the workers' relative effort; their female counterparts allocated in a similar manner only when the more productive worker had also demonstrated greater effort on the task.

The basic proposition of equity theory (Adams, 1965) is that an individual will attempt to reward each member of a dyad in accordance with the member's contribution; essentially, a participant's outcome should be proportional to his or her inputs. While a vast amount of literature has accumulated on the adult's use of equity in social relationships, only a limited number of investigations can be found concerning the development and expression of equity during childhood. Experimental studies have generally supported the notion of a developmental progression from the predominant use of the norm of parity in children approximately 5 years of age (Lane & Coon, 1972; Lerner, 1974 [Exp. 1]) to the predominant use of equity by children approximately 10 years of age (Lerner, 1974 [Exp. 2]).

While prior allocation studies involving children have focused almost exclusively on workers' relative productivity as the independent variable, a clearer developmental test of equity theory requires a broader examination of additional factors considered by the individual in allocating rewards. One such factor is the perception of effort or, more specifically, an effort difference between the members of a dyad. During the early elementary school years children increasingly tend to evaluate and reward another's moral and achievement behaviors based upon the consideration of effort and intentions rather than merely upon the

consequences of his or her actions (Berndt & Berndt, 1975; Hebble, 1971; Weiner & Peter, 1973). The present investigation sought to determine whether a similar developmental pattern would be found in children's allocation behavior to members of a dyad differing in effort, as well as productivity, on a task.

Although some contradictory evidence has been reported, studies manipulating workers' relative productivity (Leventhal & Anderson, 1970; Leventhal & Lane, 1970; Leventhal, Popp, & Sawyer, 1973) have typically shown that males have a greater preference for equity in reward distribution than females when equality and equity conflict. However, Weiner and Peter (1973) report that in middle childhood another's expenditure of effort in an achievement context is evaluated positively and rewarded by the child. Therefore, while fifth grade males may show a greater tendency to distribute rewards proportionally based upon the consideration of product differences alone, their female counterparts are expected to allocate rewards in a similar manner in the condition in which a worker exhibits relatively greater effort on a task in addition to demonstrating relatively greater productivity.

Method

Subjects and Experimenter

Twenty boys and 20 girls were tested at each of two grade levels, first (mean age = 6 years 8 months) and fifth (mean age = 9 years 10 months). Five males and 5 females from each grade level were randomly assigned to each of the four experimental conditions described below.

A large majority of subjects were Caucasion and from middle class backgrounds. A Caucasian female, an undergraduate in psychology, served as the experimenter.

Materials and Procedure

Each child was informed at the outset that his/her task would be to divide 20 prize chips, each redeemable for one small prize, between two children who had worked on identical puzzle board tasks. The puzzle boards, which each subject was initially shown, consisted of the outlines of squares, circles, and triangles placed in the arrangement of four rows of five figures each. The sequence of figures in each row was random. The subjects were instructed that they would be shown a brief portion of a videotape of the children working on the task and that they were to watch it carefully so that they could later determine for each child his fair share of the prizes.

The videotape revealed two nine year old boys (confederates of the study) each seated in front of a puzzle board with a cluttered box of matching stickers to their side. The boys were separated by a wall and apparently could have no knowledge of the other's performance on the task. The children were instructed to place as many stickers in the appropriate locations on their puzzle boards as they could in five minutes. Two videotape conditions (Hi/Hi Effort and Hi/Lo Effort) were established by manipulating the confederates' precisely staged effort on the task. (Two Hi/Lo videotapes were made with the confederates alternating "effort" roles. Extensive pilot testing indicated that the desired effort difference [Hi/Lo], or lack of effort difference [Hi/Hi], was achieved. Data from both Hi/Lo effort videotapes were combined in all

analyses.)

Immediately after viewing the videotape the child was asked to describe what he/she had seen on the television and to indicate any ways in which the boys were alike or different. All responses were tape recorded for later analysis. After the brief interview each child was shown what was supposedly each boy's completed work on the task. Two product conditions were established by either displaying two product boards with the same number of stickers (10/10) attached or two boards with different amounts completed (15/5). Therefore four experimental conditions were determined by crossing two levels of workers' effort (Hi/Hi, Hi/Lo) with two levels of workers' product (10/10, 15/5). In the Hi/Hi - 15/5 condition the workers' association with the 15 or 5 product boards was counterbalanced. Also, in the Hi/Lo - 15/5 condition, the greater product was always associated with the worker demonstrating greater effort on the task.

The subjects were asked to divide the twenty prize chips between the two workers after watching the videotape and being shown their relative products. The major dependent measure was the number of prize chips individuals chose to allocate to the two workers.

Results

Videotape Descriptions

Two independent judges rated the first and fifth graders' tape-recorded descriptions of the boys on the videotape to determine whether

effort and/or ability differences between the workers were reported. Interrater agreement ranged from .95 to 1.00. The judgment of a third independent rater was used in the few instances of disagreement. None of the children at either grade level was rated as indicating an ability difference. In addition, in the Hi/Hi effort condition, no difference in effort was reported by any child. In the Hi/Lo effort conditions, however, 2 (female) first graders (10%) and 18 (9 male and 9 female) fifth graders (90%) reported a difference in the workers' effort, $p < .001$.

Allocation Behavior

The number of prize chips allocated to the boy demonstrating greater effort and/or productivity in each condition was selected for analysis. The mean number of prize chips allocated by experimental condition, sex, and grade level are presented in Table 1.

Insert Table 1 about here

In order to independently assess the effects by grade of workers' effort under conditions of equal and unequal productivity, a series of planned orthogonal comparisons was performed separately on the allocation data from the first and fifth graders. The first grade boys were found to allocate significantly more to the worker who completed more products than his coworker ($M = 12.40$) than to a worker who completed

the same number of products (M = 10.60), F (1,32) = 4.82, $p < .05$. A nonsignificant trend in the same direction was found for the first grade girls (M = 12.10 and 10.90, respectively), F (1,32) = 2.14, $p < .2$. No significant effect of effort was found for the first graders.

For the fifth graders, there was a significant effect of product for both the boys (F (1,32) = 55.11, $p < .001$) and girls (F (1,32) = 34.35, $p < .001$). An additional analysis indicated that the fifth grade children were generally more inclined to allocate in accordance with the norm of equity in the 15/5 product conditions than were their first grade counterparts, t (38) = 2.96, $p < .01$. With regards to the 10/10 product conditions, no significant effect of workers' effort was found for either the fifth grade boys or girls, F (1,32) = 1.91 and .31, respectively, both ns. Although 50% of these children awarded the harder working child a greater number of prizes in the Hi/Lo - 10/10 condition, the allocation differences were consistently small (i.e., 11/9 and 12/8).

The fifth grade boys' allocations approximated proportionality under both Hi/Hi - 15/5 and Hi/Lo - 15/5 conditions; no effect of effort was found, $F < 1$. However, the girls allocated more rewards to a worker who demonstrated relatively greater effort on the task and completed more stickers than his coworker (Hi/Lo - 15/5) than to a worker who was characterized solely as being more productive (Hi/Hi - 15/5), F (1,32) = 14.96, $p < .001$.

Discussion

The findings of the present study support the notion of a developmental increase during the early elementary school years in the individual's use of the equity norm in allocating resources to others (Lerner, 1974). While the first graders' allocations fell approximately midway between equality (10/10) and equity (15/5) in the 15/5 product conditions, the fifth graders more closely approximated proportionally in their distributions.

A large majority of the first graders failed to report observing an effort difference in the Hi/Lo Effort conditions and their subsequent allocations were uninfluenced by this performance dimension. It is noteworthy that the one first grader in the Hi/Lo - 10/10 condition who reported seeing an effort difference awarded 10 more prize chips to the harder working, yet equally productive, individual. The question remains, therefore, as to whether the first graders would have allocated differently had they generally been more aware of the differences in the workers' effort on the task.

While a large majority of the fifth grade boys and girls in the Hi/Lo Effort conditions reported perceiving a difference in the workers' effort on the puzzle board task, this performance "input" affected only the girls' distribution of rewards to those workers and did so only under the condition of unequal productivity. When the two workers were characterized as being equally productive the observation that

one worker had tried noticeably harder than the other had only a minimal effect upon both the boys' and girls' allocation behavior. Apparently the workers' equivalent products in the Hi/Lo - 10/10 condition was a very salient evaluative dimension to the children and they chose not to markedly violate the norm of equality in their distributions. While the fifth grade boys in the Hi/Hi - 15/5 condition divided the rewards proportionally based solely upon the difference in the number of stickers completed, the girls allocated in a similar manner only when the more productive worker had also demonstrated greater effort on the task (Hi/Lo - 15/5). It appears that the accumulative effect of a worker's greater effort and greater productivity on the task persuaded the fifth grade girls to allocate more in proportion with the workers' products than was their preference when presented solely with product difference information. Since the boys were already allocating proportionally based upon the difference in the workers' products alone, an equity "ceiling" may have been reached such that any effect of the additional "input" of a difference in workers' effort in the Hi/Lo - 15/5 condition was not adequately tested. Further investigation is needed to determine whether, and under what conditions, the allocation behavior of boys will reflect a sensitivity to differences in workers' effort.

The manner in which the developing child makes decisions regarding what is a fair and deserved amount of resources for others to receive, and factors influencing these decisions, appears an important area for continued study.

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Footnotes

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Table 1

Mean Number of Prize Chips Allocated

by Experimental Condition, Sex, and Grade Level

Grade Level	Sex	Experimental Condition (Workers' Relative Effort - Workers' Relative Product)			
		Hi/Hi - 10/10	Hi/Hi - 15/5	Hi/Lo - 10/10	Hi/Lo - 15/5
1st	Male	10.40	12.60	10.80	12.20
	Female	10.00	12.00	11.80	12.20
5th	Male	10.20	14.80	11.20	14.20
	Female	10.20	12.00	10.60	14.80

Note: Values presented represent the mean number of prize chips allocated to the worker demonstrating greater effort and/or productivity in each condition. The larger mean values are reported in the Hi/Hi - 10/10 condition.